UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte TERRY L. GILTON

Appeal No. 2004-2140
Application No. 09/443,070

ON BRIEF

Before SCHEINER, GRIMES, and GREEN, Administrative Patent Judges.

GRIMES, Administrative Patent Judge.

DECISION ON APPEAL

This is a decision on appeal under 35 U.S.C. § 134 from the examiner's final rejection of claims 1, 2, 8, and 12-31, all of the claims remaining. Claims 1 and 18 are representative and read as follows:

1. A method of substantially isolating a constituent of a sample, comprising:

dispersing the sample in a mobile phase;

applying the sample to a first end of a porous capillary column formed in a nonporous substrate, said porous capillary column comprising a matrix including the same material as said nonporous substrate and at least one capture substrate disposed on said matrix; and

drawing the sample across a flowfront through said porous capillary column so as to enhance separation of the constituent from the sample by said at least one capture substrate.

18. A method of identifying the presence of a constituent in a sample, comprising:

providing the sample in a mobile phase;

applying the sample to a first end of a capillary column formed in a nonporous substrate, said capillary column comprising a matrix including the same material as said nonporous substrate;

drawing the sample across a flowfront through said capillary column and in contact with a stationary phase disposed at a selected location along said capillary column; and

detecting binding of the constituent with said stationary phase at said selected location.

The examiner relies on the following reference:

Swedberg et al. (Swedberg)	5,571,410	Nov. 5, 1996

Claims 1, 2, 8, and 12-31 stand rejected under 35 U.S.C. § 102(b) as anticipated by Swedberg.

We reverse.

Background

The specification discloses a "sample separation apparatus" that

includes a substrate with a capillary column thereon, the latter comprising a rough surface, such as a matrix which defines a plurality of pores therethrough or an open column with a rough surface, which is also referred to as a matrix. The surface area of the matrix of each capillary column facilitates the separation of the constituents of a sample over a relatively short length of the column compared to the required lengths of conventional smooth, "open", etched or ablated columns to effectively separate the constituents. Preferably, the capillary column, which is also referred to as a porous capillary column, comprises porous silicon or

> hemispherical grain silicon, and is formed on a silicon substrate. . . . The separation apparatus may also include a detector disposed proximate the capillary column. Such a detector analyzes a characteristic of a constituent as the constituent passes through the capillary column, and thereby identifies or otherwise analyzes the constituent.

Page 7. The apparatus may also comprise a "capture substrate" that has an affinity for the assayed analyte. Page 8.

Discussion

The independent claims are claims 1 and 18. Claim 1 is directed to a method of isolating a constituent of a sample, by applying the sample to one end of a "porous capillary column formed in a nonporous substrate, said porous capillary column comprising a matrix including the same material as said nonporous substrate and at least one capture substrate," then drawing the sample through the column. Claim 18 is directed to a method of identifying the presence of a constituent of a sample, by applying the sample to one end of a "capillary column formed in a nonporous substrate, said porous capillary column comprising a matrix including the same material as said nonporous substrate," then drawing the sample through the column and detecting binding of the constituent to a stationary phase in the column.

The examiner rejected all of the claims as anticipated by Swedberg, reasoning that:

> Swedberg et al. disclose a miniaturized planar column device for use in chromatographically or electrophoretically separating and analysing analytes in a mobile phase. . . . The miniaturized columns are formed (laser ablated) into a substantially planar nonporous substrate. . . . The non-porous substrate comprises polyamides such as nylons, polyimides, polyolefin compounds, and polymethylmethacrylate (see column 21, line 49 to column 22, line 4). Swedberg et al. specifically disclose that the miniaturized columns may have porosity formed thereto (sample treatment component) by incorporating a porous medium comprising particles or

> membranes made from polyamides such as nylon, polymethylmethacrylate; thus, forming a biocompatible porous matrix having the same material as the nonporous substrate.

Examiner's Answer, pages 3-4.

Appellant argues that Swedberg does not anticipate because, among other things, "while some of the porous, column-filling media described in Swedberg are the same materials (e.g., nylon and polymethylmethacrylate) as those that Swedberg describes as being useful for forming a substrate, Swedberg does not expressly or inherently describe applying a sample to a capillary column which includes a matrix formed from the same material as that of a nonporous substrate within which the capillary column is located." Appeal Brief, page 10. See also page 12: "the mere fact that the array of suitable substrates and column-filling matrices described in Swedberg could be combined in such a way . . . is insufficient to establish anticipation."

We agree with Appellant. Swedberg discloses that miniaturized columns can be formed by

> injection molding in substrates comprised of materials such as the following: polycarbonates; polyesters, including poly(ethylene terephthalate) and poly(butylene terephthalate); polyamides, (such as nylons); polyethers, including polyformaldehyde and poly(phenylene sulfide); polyimides, such as Kapton® and Upilex®; polyolefin compounds, including ABS polymers, Kel-F copolymers, poly(methyl methacrylate), poly(styrene-butadiene) copolymers, poly(tetrafluoroethylene), poly(ethylenevinyl acetate) copolymers, poly(N-vinylcarbazole) and polystyrene.

Column 21, line 62 to column 22, line 4.

Swedberg also discloses that the columns can include "sample treatment components" that can perform functions including filtration, "affinity chromatography, ion exchange chromatography, [or] a complexation reaction." See column 27, lines 33-60:

> In one embodiment, sample treatment component 214 performs a filtration function and may be filled with a porous medium made of particles, sheets, or membranes. . . . Preferably, the medium is biocompatible and may be made from such materials as nylon, cellulose, polymethylmethacrylate, polyacrylamide, agarose, or the like. . . .
>
> In the particular embodiment depicted in FIG. 15, sample treatment component 214 is designed to serve a "capture" function. Thus, sample treatment component can be an affinity chromatography, ion exchange chromatography, [or] a complexation reaction. . . . An affinity chromatography matrix may include a biological affiant, an antibody, a lectin, enzyme substrate or analog, enzyme inhibitor or analog, enzyme cofactor or analog, a capture oligonucleotide, or the like, depending on the nature of the sample. The ion exchange matrix may be an anionic or cationic ion exchange medium. Complexation reactions may include boronate reactions, dithiol reactions, metal-ion reactions, for example, with porphyrin or phenanthroline, or other reactions in which the sample is reversibly reacted with the chromatography matrix.

The examiner apparently concluded that, based on these disclosures, Swedberg's substrate can be nylon or polymethylmethacrylate and the porous medium can be nylon or polymethylmethacrylate, and that therefore the reference anticipates. We disagree. "Under 35 U.S.C. § 102, every limitation of a claim must identically appear in a single prior art reference for it to anticipate the claim." Gechter v. Davidson, 116 F.3d 1454, 1457, 43 USPQ2d 1030, 1032 (Fed. Cir. 1997). "Every element of the claimed invention must be literally present, arranged as in the claim." Richardson v. Suzuki Motor Co., Ltd., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). Here, the reference does not identically disclose the method of the instant claims and therefore does not anticipate.

When distilling a claimed invention from a prior art reference requires choosing and combining from different parts of the reference, the only proper basis for rejection (if any) is for obviousness under 35 U.S.C. § 103. A prima facie case of obviousness,

however, requires something in the prior art or in the knowledge of those skilled in the art that would have led a skilled artisan to make the combination. See In re Kotzab, 217 F.3d 1365, 1369-70, 55 USPQ2d 1313, 1316 (Fed. Cir. 2000) ("[T]o establish obviousness based on a combination of the elements disclosed in the prior art, there must be some motivation, suggestion or teaching of the desirability of making the specific combination that was made by the applicant."). The examiner has pointed to nothing that would have led those skilled in the art to combine a nylon porous matrix with a nylon substrate, or to combine a polymethylmethacrylate matrix with a polymethylmethacrylate substrate. Therefore, the examiner has also not shown that Swedberg would have made the claimed method obvious to those skilled in the art.

Summary

Swedberg does not identically disclose the claimed method. We therefore reverse the rejection under 35 U.S.C. § 102(b).

REVERSED

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Administrative Patent Judge)
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Eric Grimes) BOARD OF PATENT
Administrative Patent Judge) APPEALS AND
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